इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 15559 (2004): Polyester Strapping [PCD 12: Plastics]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

भारतीय मानक

पोलिएस्टर स्ट्रैपिंग — विशिष्टि

Indian Standard

POLYESTER STRAPPING — SPECIFICATION

ICS 55.040, 83.140.99

© BIS 2004

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 2004

Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Polyester strapping is a new product, used as an alternative to metal strips [*see* IS 1079 : 1994 'Hot rolled carbon steel sheets and strips — Specification (*fifth revision*)'; and IS 5872 : 1990 'Cold rolled steel strips (Box strappings) — Specification (*second revision*)', for tying bales, boxes, etc. This product has taken hold in many industrial sectors such as textiles, paper, steel, consumer durables, etc. Another Indian Standard IS 13960 : 1994 'Thermoplastic strappings — Specification' covers strapping made of polypropylene and Nylon-6.

The polyester strapping has many advantages over metal strips like it is lighter than steel, reduces freight cost. It has no sharp edges and does not cut or damage loads and is safer than metallic strips. The polyester strapping is weather resistant, impervious to water, UV resistant and does not rust, does not scratch, indent or cause staining due to corrosion. Elastic memory of polyester strapping enables to maintain its load-holding characteristics. It has a better resistance. It ensures long-term retained tensions and improved pack security.

Polyester strapping is safe to use. Environment friendly polyester strapping is inert and does not leach chemicals into the ground, if buried. The polyester strap is recyclable and the calorific energy of thermoplastic polyester strap may be recovered. It is as safe to incinerate as other packaging materials like paper and wood, and produces only 0.03 percent ash.

While preparing this standard considerable assistance has been derived from the following:

a) ASTM D 3950 — 1 Specification for strapping, nonmetallic; and

b) BS EN 13394 : 2000 Packaging — Specification for nonmetallic tensional strapping.

This standard has clauses **4.1** and **6.1**, which are subject to agreement between the buyer and the supplier.

For tropical countries like India, the standard temperature and the relative humidity shall be taken as 27 ± 2°C and 65 ± 5 percent respectively.

The composition of the Committee responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified values in this standard.

Indian Standard

POLYESTER STRAPPING — SPECIFICATION

1 SCOPE

This standard covers the requirements for polyester straps intended for use in baling, closing, reinforcing and bundling articles for shipment, unitizing and palletizing.

2 REFERENCE

The following standard contains provisions, which through reference in this text constitutes provision of this standard. At the time of publication the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standards are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
13360 (Part 5/Sec 1) : 1996	Plastics — Method of testing: Part 5 Mechanical properties, Section 1 Determination of tensile properties — General principles

3 TYPES

Based on the strength, the Polyester strapping shall be of the following two types:

a) Type I — Regular strength (Width 9.0 mm to 12.9 mm), and

b) Type II — High strength (Width 13.0 mm to 25.0 mm).

4 REQUIREMENT

4.1 Manufacture

The straps shall be made by extruding and orienting the Polyester (Polyethylene-terephthalate — PET). The material shall be of the quality necessary to meet the physical requirements of this standard.

4.2 Surface Finish

The requirements in regard to finishing shall be subject to agreement between the purchaser and the manufacturer, but in the case of strap required for baling jute, they shall be free of wax coating.

4.3 Colour

The polyester strapping shall be supplied in colour as agreed to between the buyer and the seller.

4.4 Intrinsic Viscosity

The material used for manufacturing of PET strap shall have intrinsic viscosity (IV), minimum of 0.84 grade measured at 25°C with solution of phenol 60 percent and Tetrachloroethane 40 percent.

4.5 Freedom from Defects

The material shall be free from harmful defects such as kinks, edge curvature, cracks or any other defects, which may impair the serviceability of the straps

4.6 Dimensions and Physical Properties

The nominal width and corresponding thickness and breaking strength shall be as given in Table 1.

4.7 Tolerance on Width and Thickness

Tolerance on thickness and width of the polyester strap shall not exceed the following limits:

Requirement	*Tolerance* mm
Thickness	± 0.06
Width	± 0.70

5 MECHANICAL PROPERTIES

5.1 Tensile Strength and Elongation

The tensile strength and elongation of a test piece, when tested in accordance with IS 13360 (Part 5/Sec 1) shall meet the requirements as given in Table 2.

5.2 Split Resistance

The test piece when tested in accordance with **5.2.1** shall conform the split resistance test.

5.2.1 Cut a test piece of 750 ± 5 mm length. Punch the test piece with a sharp pin along the longitudinal axis of the test piece at intervals of 75 mm. Fold the strap along the longitudinal axis at each of the punched area with the help of pliers. Observe the sample for any possible propagation of the split between two holes. The propagation should not be more than 2.5 mm. The pin shall be of diameter 2.4 mm, and a taper of 4 mm on one end.

5.3 Camber

The test piece when tested in accordance with **5.3.1**, shall conform the requirement of camber as given in Table 3.

5.3.1 Take a test piece of 2 000 mm length. Place it on a flat surface (*see* Fig. 1). Report the distance '*A*', in mm, as camber.

6 PACKING AND MARKING

6.1 Packing

The straps shall be properly wound on 16" core and

Table 1 Dimensions and Physical Properties

(*Clause* 4.6)

Sl No.	Nominal Width of Strapping mm	Nominal Thickness of Strapping mm	Type	Breaking Strength, *Min* N
(1)	(2)	(3)	(4)	(5)
i)	9.5	0.51	I	1 760
ii)	10.5	0.51	I	1 950
iii)	10.5	0.61	I	2 350
iv)	11.1	0.51	I	2 055
v)	11.1	0.61	I	2 460
vi)	12.7	0.51	I	2 350
vii)	12.7	0.71	I	3 275
viii)	15.6	0.76	II	4 890
ix)	15.6	0.90	II	5 790
x)	15.6	1.02	II	6 560
xi)	19.05	0.76	II	5 970
xii)	19.05	0.89	II	6 990
xiii)	19.05	1.02	II	8 010
xiv)	19.05	1.27	II	10 005
xv)	25	1.02	II	10 510

NOTE — Nominal width and thickness values are given for guidance only.

Table 2 Tensile Strength and Elongation

(*Clause* 5.1)

Sl No.	Tensile Strength kg/mm^2	Elongation Percent	Type
(1)	(2)	(3)	(4)
i)	38	10 to 20	I
ii)	42	10 to 16	II

NOTE — The cut length of the material shall be in its original condition, that is, original width and thickness shall be used as test piece. Elongation percent on 150 mm gauge length.

Table 3 Camber

(*Clause* 5.3)

Sl No.	Nominal Width mm	Camber, *Max* mm
(1)	(2)	(3)
i)	9 to 11.5	150
ii)	11.6 to 25	120

shall be supplied in coils securely packed in LLDPE stretch film, shrink film, or as agreed to between the buyer and the supplier.

6.2 Marking

Each coil of strap shall be marked with the following:

a) Identification in code or otherwise to enable the lot of consignment of manufacture to be traced back from records;

b) Name of the product;

c) Width and thickness;

d) Indication of the source of manufacture, recognized trade-mark, if any;

e) Net mass/length of the material; and

f) Packing shall be marked with proper recycling emblem.

6.3 BIS Certification Marking

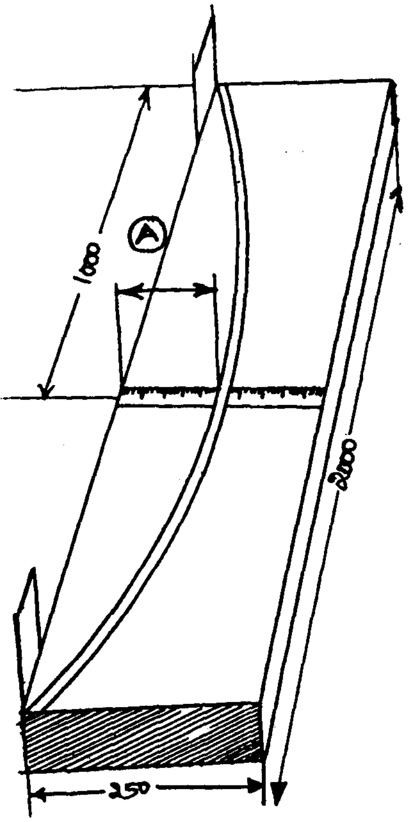
Each container may also be marked with the Standard Mark.

6.3.1 The use of Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the rules and regulations made thereunder. The details of conditions under which the license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING AND RETEST

7.1 One sample for tensile test and two for split tests shall be drawn for every 10 000 m of strap or part thereof of the strap of the same width and thickness. Test samples may be taken from any part of the coil.

7.2 Should the test piece fail to conform any of the tests specified in this standard, two fresh samples shall be drawn from the same lot for retesting for all the requirements. In case these test pieces conform to the tests, the material represented by the test samples shall be deemed to comply with the requirements of the standard. If either of these additional samples fail, the material represented by the test samples shall be deemed to be rejected.



All dimensions in millimetres.

FIG. 1 CAMBER CALCULATION

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Plastics Sectional Committee, PCD 12

Organization	*Representative(s)*
Borouge Indian Pte Ltd, Mumbai	Shri P. R. Singhvi (***Chairman***)
All India Plastic Industries Association, Delhi	Shri Ravi K. Aggarwal Shri V. P. Bhardwaj (*Alternate*)
Central Food Technological Research Institute (CFTRI), Mysore	Dr V. Prakash Shri K. R. Kumar (*Alternate*)
Central Institute of Plastics Engineering & Technology (CIPET), Chennai	Dr Sushil K. Verma Shri S. K. Sharma (*Alternate*)
Directorate General of Health Services, New Delhi	Assistant Director General (PFA) Technical Officer (PFA) (*Alternate*)
Gas Authority of India Ltd, Noida	Shri Shivaji Basu Shri Manish Khandelwal (*Alternate*)
GE Plastics India Limited, Gurgaon	Shri P. V. Murali Mohan Shri Gopal Majumdar (*Alternate*)
Gharda Chemicals Ltd, Dist Thane	Dr B. K. Desai Dr H. P. Natu (*Alternate*)
Gujarat State Fertilizers & Chemicals Limited, Vadodara	Shri Rameshkumar Dr Y. P. Singh (*Alternate*)
Haldia Petrochemicals Limited, Kolkata	Dr Swapan Dhara Shri Amitava Sanyal (*Alternate*)
Indian Centre for Plastics in the Environment, New Delhi	Dr A. N. Bhat
Indian Institute of Packaging, Mumbai	Shri Rajiv Dhar Dr N. G. Mokashi (*Alternate*)
Indian Petrochemicals Corporation Limited, Vadodara	Shri A. K. Khera Shri V. C. Francis (*Alternate*)
Industrial Toxicology Research Centre (ITRC), Lucknow	Dr V. P. Sharma Dr A. K. Agarwal (*Alternate*)
Jain Irrigation Systems Ltd, Jalgaon	Dr H. C. Mruthyunjaya Shri S. B. Joshi (*Alternate* I) Shri A. P. Choudhary (*Alternate* II)
Machino-Basell India Limited, Gurgaon	Shri Sanjeev Kumar Varshney Shri Deep Banerjee (*Alternate*)
Ministry of Defence (DMSRDE), Kanpur	Dr R. K. Singh Shri R. K. Gupta (*Alternate*)
Ministry of Environment & Forests, New Delhi	Dr (Shrimati) Indrani Chandrasekharan Dr U. Sridharan (*Alternate*)
National Chemical Laboratory, Pune	Dr B. D. Sarwade Dr P. G. Shukla (*Alternate*)
Reliance Industries Ltd, Mumbai	Dr Y. B. Vasudeo Dr U. K. Saroop (*Alternate*)
Saint-Gobain Vetrotex India Ltd, Thimmapur	Shri D. H. Kashyap Shri M. A. Naeer (*Alternate*)
Shriram Institute for Industrial Research, Delhi	Dr P. K. Kaicker Dr R. K. Raina (*Alternate*)
Supreme Petrochem Ltd, Mumbai	Shri P. B. Raman Shri Anirudha Bhide (*Alternate*)
VIP Industries Ltd, Nasik	Shri Siddhartha Roy Shri S. Gopakumar (*Alternate*)
XPRO India Ltd, Faridabad	Shri C. Bhaskar Shri Manmohan Krishan (*Alternate*)
BIS Directorate General	Dr (Shrimati) Vijay Malik, Director and Head (PCD) [Representing Director General (*Ex-officio*)]

Member Secretary
Shri A. K. Bhatnagar
Joint Director (PCD), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. PCD 12 (2247).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 ***website*** **: www.bis.org.in**

Regional Offices:

		Telephones
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	260 3843 260 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	2832 9295, 2832 7858 2832 7891, 2832 7892

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Simco Printing Press, Delhi